

WHAT IS CLAIMED IS:

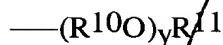
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A suds-forming and/or foam-forming composition having increased suds volume and suds retention, said composition comprising:

- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
 - i) units capable of having a cationic charge at a pH of from about 4 to about 12;
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
 - b) an effective amount of a deterative surfactant; and
 - c) the balance carriers and other adjunct ingredients;
- provided that a 10% aqueous solution of said suds-forming and/or foam-forming composition has a pH of from about 4 to about 12.

2. A composition according to Claim 1 wherein said polymeric suds stabilizer (a) further comprises:
 - ii) units capable of having an anionic charge at a pH of from about 4 to about 12;
 - iii) units capable of having an anionic charge and a cationic charge at a pH of from about 4 to about 12;
 - iv) units having no charge at a pH of from about 4 to about 12; and
 - v) mixtures of units (i), (ii), (iii), and (iv).
3. A composition according to Claim 2 wherein said polymeric suds stabilizer has an average molecular weight of from about 1,000 to about 2,000,000 daltons.
4. A composition according to Claim 1 wherein the deterative surfactant (b) is selected from the group consisting of linear alkyl benzene sulfonates, a-olefin sulfonates, paraffin sulfonates, methyl ester sulfonates, alkyl sulfates, alkyl alkoxy sulfates, alkyl sulfonates, alkyl alkoxy carboxylates, alkyl alkoxyated sulfates, sarcosinates, taurinates, and mixtures thereof.
5. A composition according to Claim 1, wherein said other adjuncts ingredients (c) is selected from the group consisting of : soil release polymers, polymeric dispersants,

- $$A-(Z)_n-L-\left[\begin{array}{c} R^2 \\ | \\ R^1 \\ | \\ R^3 \end{array} \right]_m-\text{C}(=\text{O})$$

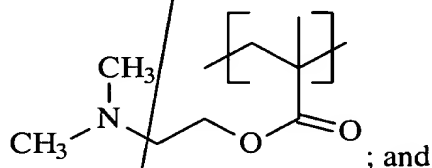
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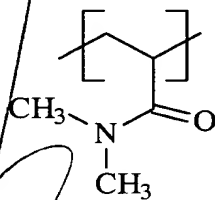
wherein R^{10} is C_2 - C_4 linear or branched alkylene, and mixtures thereof; R^{11} is hydrogen, C_1 - C_4 alkyl, and mixtures thereof; y is from 1 to about 10; or NR^4R^5 form a heterocyclic ring containing from 4 to 7 carbon atoms, optionally containing additional hetero atoms, optionally fused to a benzene ring, and optionally substituted by C_1 to C_8 hydrocarbyl; and wherein said polymeric suds stabilizer has a molecular weight of from about 1,000 to about 2,000,000 daltons.

10. A composition according to Claim 9, wherein said polymeric suds stabilizer (a) is a copolymer of:

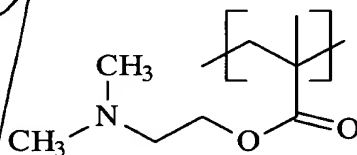
i)



ii)

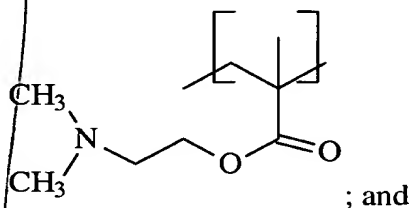


11. A composition according to Claim 9, wherein said polymeric suds stabilizer (a) is a homopolymer of:




12. A composition according to Claim 9, wherein said polymeric suds stabilizer (a) is a copolymer of:

i)



ii)



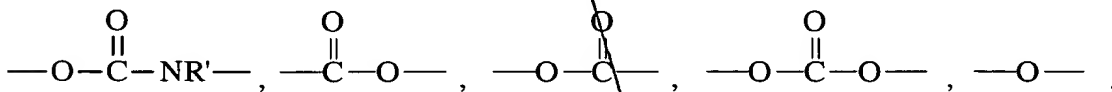
Chemical structure of a polymer repeat unit, showing a backbone with a side chain containing a carboxylic acid group ($\text{HO}-\text{C}(=\text{O})$).

$$\left[\text{---} \text{CH}_2 \text{---} \text{CH}(\text{R}^1) \text{---} \text{CH}_2 \text{---} \text{CH}(\text{COOH}) \text{---} \right]_n$$

- $$\left[\text{(R)}_x - \overset{\text{R}^1}{\underset{|}{\text{(CH)}}}_y - \overset{\text{R}^2}{\underset{|}{\text{(CH)}}}_z \right]_n$$

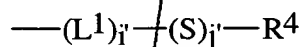
$$\left[\text{(R)}_x - \overset{\text{R}^1}{\underset{|}{\text{(CH)}}}_y - \overset{\text{R}^2}{\underset{|}{\text{(CH)}}}_z \right]_n$$

- $$-(L)_i-(S)_i-R^3$$

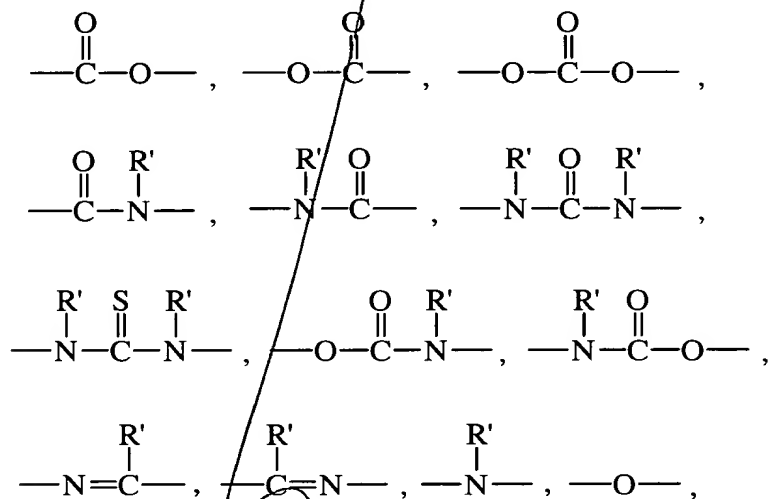
$$-(L)_i-(S)_i-R^3$$

$$-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NR}'-, -\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-, -\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-, -\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-, -\text{O}-$$



wherein each R^8 , R^9 , and R^{10} is independently selected from the group consisting of hydrogen, $-(\text{CH}_2)_m\text{R}^{11}$, and mixtures thereof, wherein R^{11} is $-\text{CO}_2\text{H}$, $-\text{SO}_3\text{M}$, $-\text{OSO}_3\text{M}$, $-\text{CH}(\text{CO}_2\text{H})\text{CH}_2\text{CO}_2\text{H}$, $-\text{CH}_2\text{P}(\text{O})(\text{OH})_2$, $-\text{OP}(\text{O})(\text{OH})_2$, and mixtures thereof; provided that one R^8 , R^9 , or R^{10} is not a hydrogen atom; R^2 has the formula:

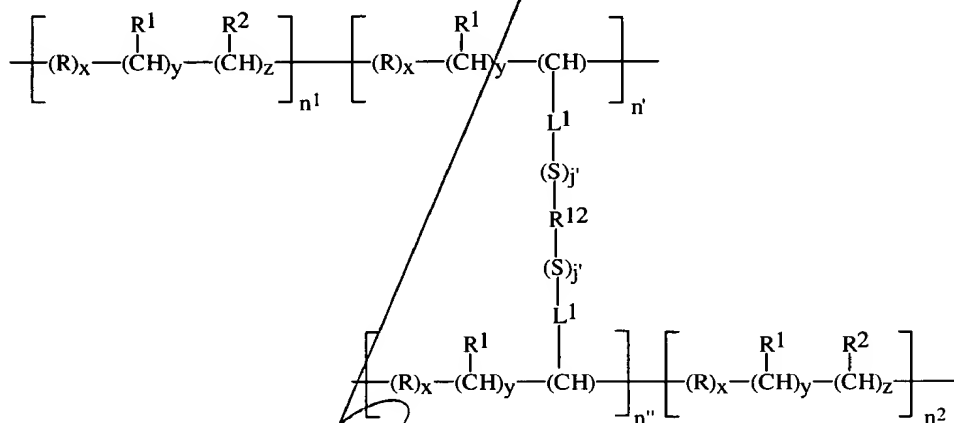


wherein L^1 is a linking unit independently selected from the following:



and mixtures thereof; wherein R' is independently hydrogen, C_1 - C_4 alkyl, and mixtures thereof or alternatively R' and S can form a heterocycle of 4 to 7 carbon atoms, optionally containing other hetero atoms and optionally substituted; R^4 is independently selected from amino, alkylamino carboxamide, 3-imidazolyl, 4-imidazolyl, 2-imidazolyl, 4-imidazolyl, 2-piperidinyl, 3-piperidinyl, 4-piperidinyl, 1-pyrazolyl, 3-pyrazoyl, 4-pyrazoyl, 5-pyrazoyl, 1-pyrazolinyl, 3-pyrazolinyl, 4-pyrazolinyl, 5-pyrazolinyl, 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, piperazinyl, 2-pyrrolidinyl, 3-pyrrolidinyl, guanidino, amidino, and mixtures thereof; each S is independently selected from C_1 - C_{12} linear alkylene, C_1 - C_{12} branched alkylene, C_3 - C_{12} linear alkenylene, C_3 - C_{12} branched alkenylene, C_3 - C_{12} hydroxyalkylene, C_4 - C_{12} dihydroxyalkylene, C_6 - C_{10} arylene, C_8 - C_{12} dialkylarylene, $-(\text{R}^5\text{O})_k\text{R}^5-$, $-(\text{R}^5\text{O})_k\text{R}^6(\text{OR}^5)_k-$, $-\text{CH}_2\text{CH}(\text{OR}^7)\text{CH}_2-$, and mixtures thereof; R^5 is C_2 - C_4 linear alkylene, C_3 - C_4 branched alkylene, and mixtures thereof; R^6 is C_2 - C_{12} linear alkylene, and mixtures thereof; R^7 is

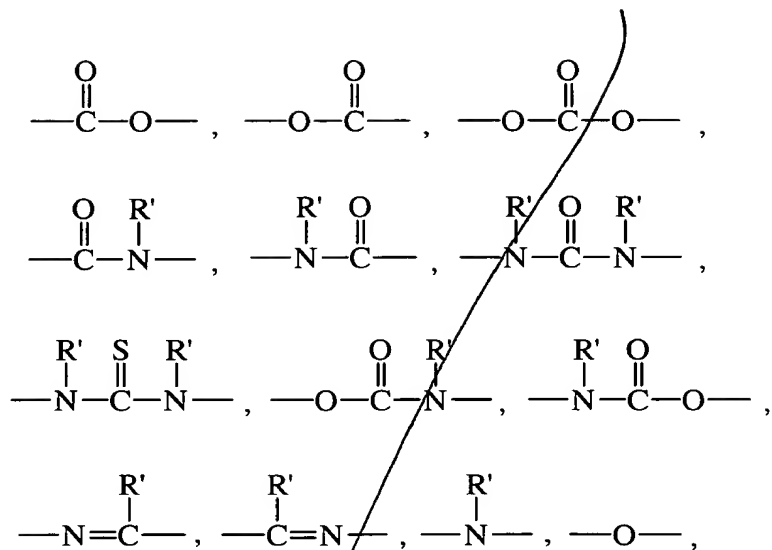
15. A composition according to Claim 1 wherein said polymeric suds stabilizer (a) is a zwitterionic polymeric suds stabilizer of the formula:



wherein R is C₁-C₁₂ linear alkylene, C₁-C₁₂ branched alkylene, and mixtures thereof; R¹ is a unit capable of having a negative charge at a pH of from about 4 to about 12; R² is a unit capable of having a positive charge at a pH of from about 4 to about 12; C₁-C₁₂ linear alkylene amino alkylene having the formula:



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and mixtures thereof; $n^1 + n^2$ has a value such that said zwitterionic polymers suds stabilizer has an average molecular weight of from about 1,000 to about 2,000,000 daltons; n' is equal to n'' and further $n' + n''$ is less than or equal to 5% or the value $n^1 + n^2$; x is 0 to 6; y is 0 or 1; and z is 0 or 1.

16. The composition according to Claim 1 wherein the composition is a personal care composition.
17. The composition according to Claim 1 wherein the composition is a laundry detergent composition.
18. The composition according to Claim 1 wherein the composition is a hard surface cleaning composition.
19. The composition according to Claim 1 wherein the composition is an agrochemical foaming composition.
20. The composition according to Claim 1 wherein the composition is an oil-field foaming composition.
21. The composition according to Claim 1 wherein the composition is a fire-fighting foaming composition.
22. A method for providing extended suds and/or foam volume and suds and/or foam duration when washing parts of a person's body in need of cleaning, comprising

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the step of contacting said parts with an aqueous solution of a personal care composition, said personal care composition comprising:

- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
 - i) units capable of having a cationic charge at a pH of from about 4 to about 12;

provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
 - b) an effective amount of a deterative surfactant; and
 - c) the balance carriers and other adjunct ingredients;
- provided that the pH of a 10% aqueous solution of said personal care composition is from about 4 to about 12.

23. A method for providing increased suds volume and increased suds retention while washing a fabric and/or garment in need of cleaning, comprising the step of contacting said fabric and/or garment with an aqueous solution of a laundry detergent composition, said laundry detergent composition comprising:

- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
 - i) units capable of having a cationic charge at a pH of from about 4 to about 12;

provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
 - b) an effective amount of a deterative surfactant; and
 - c) the balance carriers and other adjunct ingredients;
- provided that the pH of a 10% aqueous solution of said laundry detergent composition is from about 4 to about 12.

24. A method for providing increased suds volume and increased suds retention while cleaning a hard surface in need of cleaning in need of cleaning, comprising the step of contacting said hard surface with an aqueous solution of a hard surface cleaning composition, said hard surface cleaning composition comprising:

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- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
 - i) units capable of having a cationic charge at a pH of from about 4 to about 12;
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
 - b) an effective amount of a deterative surfactant; and
 - c) the balance carriers and other adjunct ingredients;
- provided that the pH of a 10% aqueous solution of said hard surface cleaning composition is from about 4 to about 12.
25. A method for providing increased suds volume and increased suds retention while treating a plant and/or crop in need of treatment, comprising the step of contacting said plant and/or crop with an aqueous solution of an agrochemical foaming composition, said agrochemical foaming composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
 - i) units capable of having a cationic charge at a pH of from about 4 to about 12;
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
 - b) an effective amount of a deterative surfactant; and
 - c) the balance carriers and other adjunct ingredients;
- provided that the pH of a 10% aqueous solution of said agrochemical foaming composition is from about 4 to about 12.
26. A method for providing increased suds volume and increased suds retention while drilling for oil in oil-fields, comprising the step of contacting said drilling equipment and/or subterranean formations with an aqueous solution of an oil-field foaming composition, said oil-field foaming composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:

27. A method for providing increased suds volume and increased suds retention while fighting a fire, comprising the step of contacting said fire with an aqueous solution of a fire-fighting foaming composition, said fire-fighting foaming composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
 - i) units capable of having a cationic charge at a pH of from about 4 to about 12;
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
 - b) an effective amount of a deterative surfactant; and
 - c) the balance carriers and other adjunct ingredients;
- provided that the pH of a 10% aqueous solution of said fire-fighting foaming composition is from about 4 to about 12.